

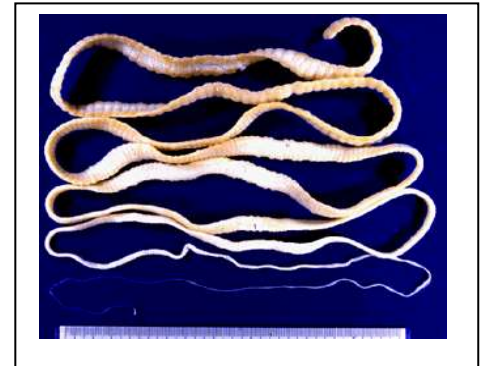
Parasites

- **Parasites** are organisms that live on or in another organism, called the host, and obtain nourishment at the expense of the host.
- Cause harm to the host

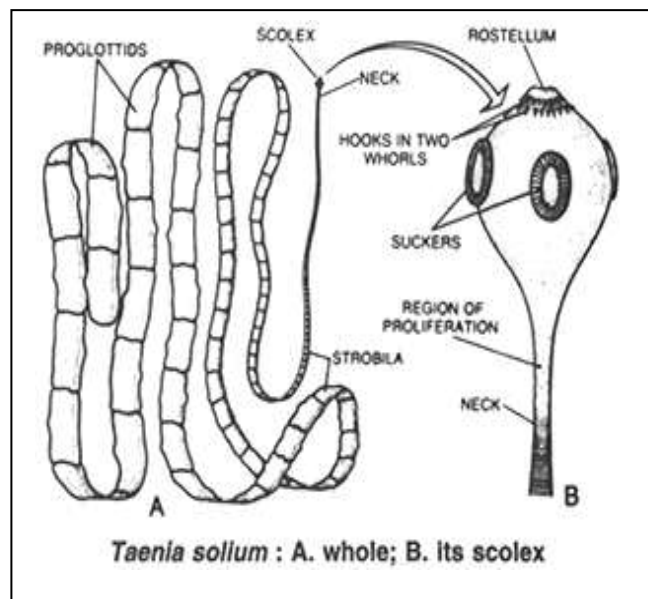


Example: Pork Tapeworm

- ▶ The pork tapeworm, *Taenia solium*, lives inside the gut and needs to survive in a hostile environment.
- ▶ Is ribbon like
- ▶ Can grow to 10 m



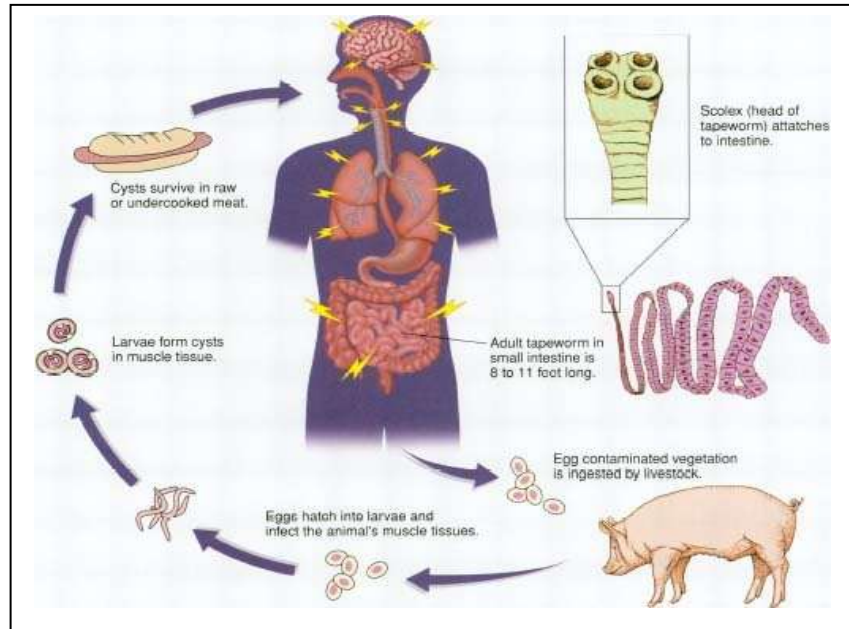
- ▶ **Basic Adaptations:**
 - ▶ Head made of muscle with suckers and hooks
 - ▶ Body is a series of segments
 - ▶ Tapeworms have many segments.
 - ▶ Each segment is able to produce fertilized eggs.
 - ▶ Eggs are spread alone or in groups, and can pass out with the stool or through the anus.



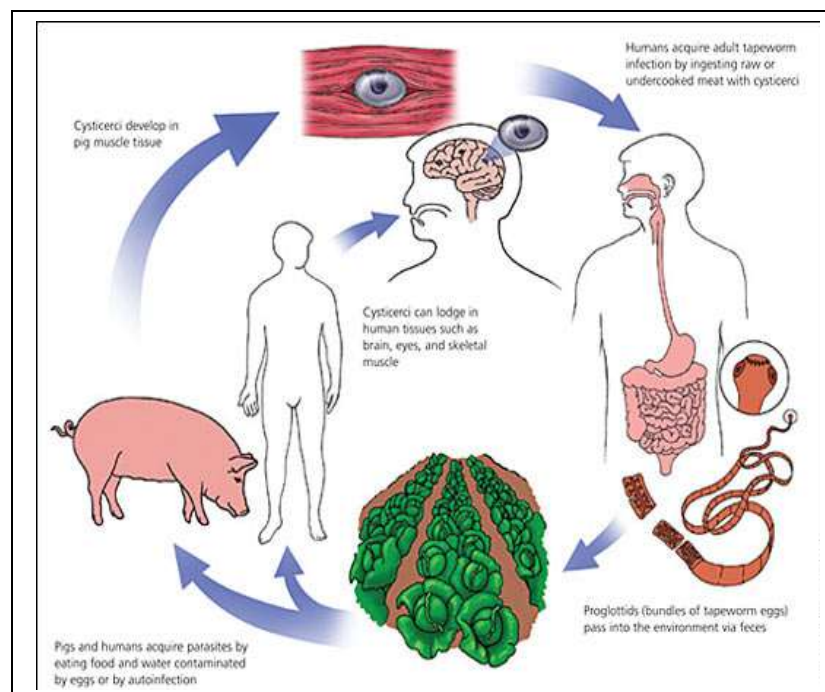
Life Cycle of the pork tapeworm

► The tapeworm has 2 hosts:

1. Human (primary host) – infected by eating undercooked infected meat
2. Pig (secondary host) – infected when it feeds in drainage channels contaminated by human faeces



- Eggs are shed from human faeces
- Pigs or humans ingest eggs
- Eggs hatch and larva infect muscles where they form cysts
- Humans can eat this infected pig meat
- Cysts can then develop into adult tapeworms



- ▶ Humans with pork tapeworm can re-infect themselves (auto infection) if they have poor hygiene. They can ingest tapeworm eggs they pick up on their hands while wiping or scratching their anus or the skin around it.
- ▶ Those who are infected can expose other people to *the* eggs, usually through food handling.

Symptoms

- ▶ Tapeworm infection usually does not cause any symptoms though some have abdominal discomfort.
- ▶ People often realize they are infected when they pass segments of the worm in their stool, especially if the segments are moving.
- ▶ Cysts can damage organs

Hostile Environment in the gut:

The tapeworm must survive:

- ▶ Digestive juices and mucous
- ▶ Constant churning and peristalsis contractions of gut muscles
- ▶ Changes in pH (to extremes)
- ▶ Immune system of host
- ▶ Death of host (also kills parasite)



Details of Adaptations of the pork tapeworm:

- ▶ the tapeworm has adapted by having:
 - ▶ a means of penetrating the host (ingested)
 - ▶ a way of attaching to the host (suckers and hooks)
 - ▶ a thick cuticle (to protect from digestive enzymes and host's immune system)
 - ▶ a large surface area to volume ratio (for absorbing nutrients over entire body)
 - ▶ Can secrete enzyme inhibitors so not affected by host's enzymes
 - ▶ only organs essential for life (ex: reproduction rather than one for sensing or moving)
 - ▶ Segments that are hermaphroditic (male and female sex organs present) so no mate required
 - ▶ large numbers of eggs are produced
 - ▶ resistant stages to overcome the period away from the host (eggs have resistant shells to survive until eaten by secondary host)